

NATIONAL ICE CENTER VISITING SCIENTIST PROGRAM

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LONG TERM GOALS

The long-term goal of the National Ice Center (NIC) Visiting Scientist Program is to build the Science Program at the NIC, which will provide near real-time global ice coverage support to vessels operating in ice-infested waters.

OBJECTIVES

The NIC Visiting Scientist Program is managed by the University Corporation for Atmospheric Research (UCAR). The NIC Visiting Scientist Program has appointed a Senior Visiting Scientist to build and lead the activities of the new Science Program within the NIC. Several postdoctoral visitors will be appointed in the future.

The mandate of the NIC is to provide global sea ice analyses, forecasts, outlooks and ship routing recommendations within the marginal ice zone of all Arctic and Antarctic seas, with the support from the US Navy, the National Oceanic & Atmospheric Administration (NOAA) and the US Coast Guard (USCG).

The Science Program is being established to support the medium- to long-term operational goals of the NIC, and to ensure that NIC products are exploited within the scientific community. The specific aims of the science program are as follows:

1. To be a source of scientific expertise for the NIC. To maintain an effective awareness and critical judgment regarding the quality and scope of scientific work which is available to the NIC for future operational use, allowing the recommendation, planning and coordination of projects which support improved operations. This will be based on the current priorities of operational issues at the NIC.
2. To provide a voice for operational requirements within the scientific community. To seek to influence the direction of scientific endeavor to support operational requirements of the NIC, through participation in proposals and studies. The aim here is to emphasize not only the range, accuracy and precision of products, but also computational efficiency, with the eventual transitioning of successful algorithms to NIC operations. Such transitioning will be supported by NIC resources where appropriate.
3. To plan, coordinate and carry out product evaluation activities which will support feedback to scientists and NIC operations. The NIC Science Program can, for example, liaise with the USCG and Navy to provide support for campaigns which require air support and loan of instrumentation. The Science Program can also liaise with the Ice Reconnaissance Officer to assist with the provision of trained personnel for Arctic and Antarctic campaign observations.

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4. To encourage the use of NIC projects and resources by the scientific community. This should include transition of products to data archiving facilities as appropriate. The NIC has access to data sets which are of wide value, including satellite data and digital ice climatology data. The NIC Science Program can also encourage, and assist with, the migration of appropriate products and data sets to Data Active Archive Centers (DAACs), such as the National Snow and Ice Data Center.
5. To act as a focus for inter-agency cooperation.

APPROACH

The objectives listed above will be met through a medium- to long-term evolution in the main emphasis of the Science Program activities as follows:

1. In the short-term: definition and implementation of in-house team and facilities, in consultation with Science Program sponsors and NIC management.
2. In the medium term:
 - Evaluation of existing (US and foreign) products and algorithms which have the potential to support ice operations, with feedback to the scientific and algorithm development community and algorithm review panels.
 - Publicizing of NIC operational requirements within the scientific community.
 - Recommendation and initiation of new algorithm and product developments, in consultation with key research groups.
3. In the long term:
 - Development of new algorithms and products in collaboration with key groups.
 - Migration of algorithms to NIC operational environment and DAACs, as appropriate.

ACCOMPLISHMENTS

1. The recruitment process (search, selection and appointment) of the Senior Visiting Scientist to lead the activities of the new NIC Science Program was completed.
2. Science Plan developed. This defines priorities and activities for the science unit at NIC. A statement of requirements has also been developed for the post-doctoral program. A meeting is being arranged to finalize sponsor requirements and resources for the post-doctoral program.
3. Proposal submitted to NOAA to support modeling of decadal-scale changes in Arctic climate using NIC digital climatology data. This proposal, led by the University of Alaska Fairbanks, is under review.
4. Development of joint Canadian Ice Service - National Ice Center science plan for the North Water Experiment. This campaign, near the north of Greenland, will provide a test site for several technology developments, including:
 - data fusion
 - NIC ice charts
 - sea ice models (including PIPS 2.0);
 - ice tracking (LARA, GPS, Noetix ice tracker);
 - ice classification (Kansas University knowledge-based and Noetix ice classifiers);
 - It is also expected that this campaign will be the focus for post-doctoral activities.
5. A number of discussions have taken place regarding establishing collaborations between the NIC and other groups and these are expected to lead to joint proposals or collaborative

activities within the science program. These include ideas related to the use of NIC digital climatology data, PIPS 2.0 model for contaminant tracking, SSM/I validation.

SCIENTIFIC/TECHNICAL RESULTS

Development and Demonstration of Satellite Data Fusion

The senior scientist is concentrating initial technical effort on data fusion activities, with the aim of optimizing the synergy between the different forms of data available at NIC. As part of this, a set of programs have been written under AVS visual programming and data visualization environment which will serve as the basis for a library of data fusion tools. This library is still under development. The tools will ingest NIC internal format image data (OLS, Radarsat, AVHRR, SSM/I) and generate data fusion products. Collaborators on this project are the University of Manitoba, JPL and University of Alaska Fairbanks. The products will be tested initially using the NOW experiment.

IMPACT FOR SCIENCE (and/or) SYSTEMS APPLICATIONS

The activities are in a very preliminary stage. The data fusion work is expected to lead to evaluation within the operational ice environment at a later stage.

TRANSITIONS

Nothing to report at this time.

RELATED PROJECTS

None.